

What is claimed is:

1. A digital serial communications hub, comprising:

(a) a controller; and

(b) a plurality of receiver-transmitter units operatively coupled to the controller;

5 wherein the controller is programmed to delay, route and regenerate data at mixed baud rates, mixed character framing bits and mixed protocols by, in part, digitizing and quantizing all incoming data in the time domain.

2. A digital serial communications hub as recited in claim 1, wherein the controller is further programmed to filter for error correction and store in memory the time domain data.

10 3. A digital serial communications hub as recited in claim 2, wherein the controller is further programmed to perform the following steps:

(1) measuring the received data's transition times in the time domain, and storing in memory the measured time values;

15 (2) analyzing the stored time values to determine if any error correction should be applied to the values and, if so, applying an error correction procedure to the values in need of error correction; and

(3) reconstructing the received data with error correction.

4. A digital serial communications hub as recited in claim 3, wherein the error correction procedure of step (2) comprises:

20 determining a common denominator of a standard baud rate, wherein the common denominator is a unit of time equal to the time employed to transmit a single bit at a certain baud rate;

dividing each measured time value of the received data by the common denominator; and

25 rounding off each measured time value to a closest interval equal to an integral number of common denominator periods.

5. A digital serial communications hub as recited in claim 3, wherein the controller is a microcontroller including a time module, and the step of reconstructing the received data is performed by sequentially moving the time values into the timer module where they are used to reconstruct the data, including the use of a port identifier associated with the received data to determine the port(s) on which the data will be re-transmitted.

6. A digital serial communications hub as recited in claim 1, wherein the controller is further programmed to delay retransmission of the received data.

7. A method for operating a digital serial communications hub, comprising digitizing and quantizing all incoming data in the time domain, error correcting the data in the time domain, and re-transmitting the error corrected data mixed baud rates, mixed character framing bits and mixed protocols.

8. A method as recited in claim 7, further comprising the following steps:

(1) measuring the received data's transition times in the time domain, and storing in memory the measured time values;

(2) analyzing the stored time values to determine if any error correction should be applied to the values and, if so, applying an error correction procedure to the values in need of error correction; and

(3) reconstructing the received data with error correction.

9. A method as recited in claim 8, wherein the error correction procedure of step (2) comprises:

determining a common denominator of a standard baud rate, wherein the common denominator is a unit of time equal to the time employed to transmit a single bit at a certain baud rate;

dividing each measured time value of the received data by the common denominator; and rounding off each measured time value to a closest interval equal to an integral number of

common denominator periods.